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SCIENCE NEWS LETTER

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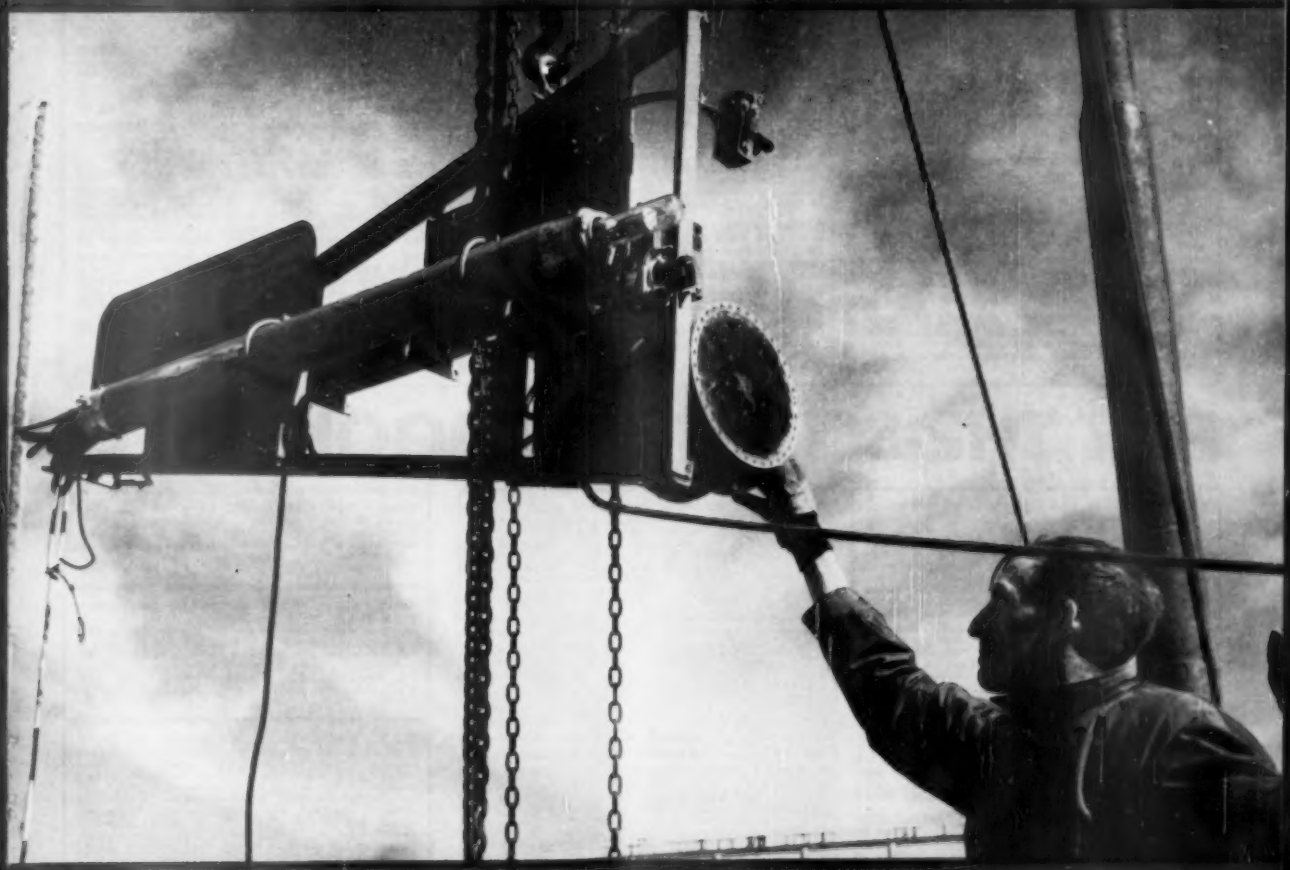

Underwater Eye

See Page 279

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BIOLOGY

Cell Makes Virus

Researchers reported that an animal cell has "manufactured" a complete virus from only the naked nucleic acid of a virus inserted into the cell.

➤ A MAJOR CONTRIBUTION in understanding viruses was reported at the Federation of American Societies for Experimental Biology in Atlantic City.

Researchers from the University of Minnesota have discovered that the cell has the machinery within itself to duplicate a virus.

Apparently there is a specific attachment between the surface of a cell and the protein coat of a virus that determines whether the virus attacks the cell or not. A cell resistant to polio virus, for example, does not have the kind of protein on its surface that will combine with the polio virus protein.

The Minnesota researchers removed the protein coat from polio virus by chemical treatment and released nucleic acid. The nucleic acid was then introduced into naturally resistant cells. These infected resistant cells produced polio virus from the nucleic acid that was identical with the original polio virus so far as is known.

Susceptible human and monkey cells could be infected by this "new" polio virus but resistant cells from rabbits, mice, hamsters, chickens and guinea pigs were not infected, Drs. L. C. McLaren, J. J. Holland and J. T. Syverton made the discovery

Two of the nation's top virus researchers pointed to the significance of this research both in contributing to basic knowledge and to application in medicine

For one thing, as Dr. T. Francis, University of Michigan, said, it appears that a virus is not merely a "microbial midget," but a distinct organism.

The research also sheds some light on the possible evolution of viruses. Perhaps, and this is only an hypothesis, some naked mutant nucleic acid entered a cell and the first virus was born.

The virus study may lead to development of new kinds of viruses and vaccines. It might be possible to take nucleic acid from two different viruses and put them inside one cell. It is not now known if the cell would then make two viruses, one virus with the characteristics of both original viruses or some kind of hybrid.

When more is understood of the nature of the protein substance that makes a cell resistant, it might be possible to keep a virus out of normally susceptible cells.

However, as Dr. A. B. Sabin of the University of Cincinnati explained, this research is extremely important now in that it has greatly increased our basic knowledge of viruses.

Atherosclerosis Study

➤ BANTUS AND baboons are helping scientists in their search for the "why's" and 'how's" of atherosclerosis.

Studies of the Bantu tribe of South Africa reported by Dr. Jack P. Strong of Louisiana State University School of Medicine indicate that fatty deposits do not always precede the formation of scars, or plaques, in the aorta. Differences related to age were also reported.

In comparison with the New Orleans white person and the New Orleans Negro, the Bantu had a higher average percentage of fatty streaks on the inside of his blood vessel walls. This was true up to age 30, Dr. Strong told scientists at the Federation meeting.

By age 40, the white person had the highest percentage of scarring—the formation of fibrous plaques—with the Bantu coming out lowest.

Some 163 baboons studied in their natural habitat indicate that neither fat in the diet nor cholesterol in the blood is responsible for fatty deposits in the baboon's aorta.

The discovery of prominent pearly plaques with hemorrhages in their centers, much like human lesions of the aorta, means that the baboon will be an excellent laboratory animal for studying atherosclerosis, Dr. Henry C. McGill, also of Louisiana State, said.

The serum cholesterol levels in the animals ranged from 38 to 136 milligrams percent in comparison with a range of 80 to 140 milligrams percent in captive baboons.

➤ PIGEONS may be the "guinea pigs" when it comes to studying atherosclerosis in the laboratory.

Research being carried out at the Bowman Gray School of Medicine, Winston-Salem, N. C., indicates that one kind of pigeon, the white carneau, has atherosclerotic lesions "strikingly similar" to those in the human disease. Laboratory study of the disease has been difficult because few animals seem to have atherosclerosis.

Another interesting characteristic of the disease in pigeons is that show racer pigeons are resistant to it, while spontaneous atherosclerosis occurs in the white carneau breed. Both breeds are fed identical diets containing saturated and unsaturated fats, and housed under identical conditions. Saturated fats have been considered by some researchers to play an important role in hardening of the arteries.

It appears that factors other than diet, possibly genetic factors, may influence atherosclerosis.

Drs. T. B. Clarkson, H. B. Lofland, R. W. Prichard and M. G. Netsky illustrated their research with an exhibit at the Federation meeting.

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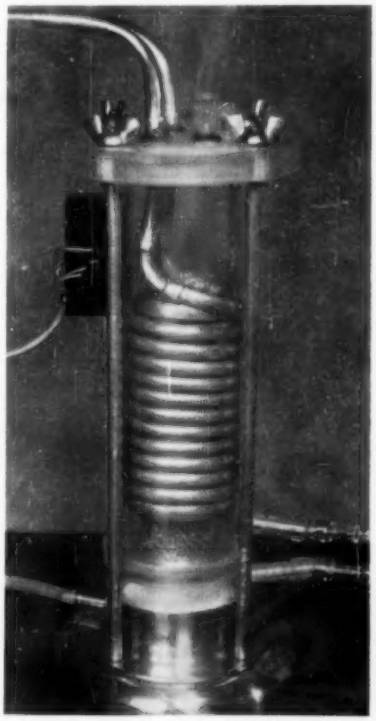

IN COLD BLOOD — This single chambered apparatus is capable of pumping, oxygenating and cooling the blood.

MEDICINE

Circulating Cold Blood Gives Surgeon More Time

➤ COLD BLOOD is now being pumped through the body, providing the surgeon more time to perform open heart operations.

In contrast to previous methods that allow the surgeon only six to eight minutes to work inside the heart, the new technique assures greater safety for the patient, sets no time limit for the surgeon, and gives opportunity for better repair of intricate heart defects.

The cold blood technique was devised by Dr. Frank Gollan of the Nashville, Tenn., Veterans Administration hospital. The method involves circulating cooled blood that has had oxygen added. The blood travels the main arteries of the body by the pumping action of the heart-lung machine.

The general method of lowering body temperature has been by placing the patient in a tub of cold water or in a rubber blanket through which ice water flowed.

But these external methods permit only a short period of interrupted blood circulation, allowing the surgeon only six to eight minutes to work on the heart.

If such methods are used for longer than this brief time, blood does not flow evenly to organs such as the brain and heart which are then damaged by lack of oxygen.

Dr. Gollan's method cools the internal organs first and at the same time supplies an adequate flow of blood and oxygen to these vital organs.

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SEISMOLOGY

Rare Earthquake in South American Straits

➤ AN EARTHQUAKE where there has never before been earthquakes has been detected.

A large 'quake took place the morning of April 8, at about 11:45 Greenwich Time, in the northern Magellan Straits near the tip of South America.

This is unusual, Jim Lander of the U. S. Coast and Geodetic Survey said, since there has never been an earthquake that far north in the Straits. Previously there had been a gap in a chain of earthquakes occurring in the region. The April 8 one, tentatively located at 72 degrees west longitude and 51 degrees south latitude, fills in the gap which had extended from 47 to 53 degrees south latitude.

Although only 12 northern stations reported the earthquake, there are good indications, Mr. Lander said, that it is a deep one and quite strong—estimated at well over six on the seismograph scale which runs from 0, just barely detectable, to about 8.5.

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AERONAUTICS

To Launch "Talking-Moons"

➤ A SATELLITE communications system capable of handling "vast amounts of routine traffic" will be launched in about a year, Rear Adm. John E. Clark, deputy director of the Defense Department's Advanced Research Projects Agency, told the World Congress of Flight meeting in Las Vegas, Nev.

Adm. Clark said this would free surface communications for top priority messages. The Atlas "talking satellite" launched in December, was the forerunner of this type of satellite.

Adm. Clark revealed that ARPA has issued orders for "development of a highly sophisticated version of this system" with a research and development period lasting at least five years.

"The satellites will be launched by IRBM-type boosters into 300- to 500-mile orbits," he said. "The system itself will have a communications capacity equivalent to 20 continuously available 100-words-per-minute teletype channels."

A later phase of the program will be the orbit repeater system. This phase will provide satellites capable of receiving and retransmitting messages on an instantaneous basis from 3,000- to 22,300-mile orbits. An ICBM-type booster will be employed to develop a capability to launch the instantaneous repeater payload into a stabilized 24-hour orbit at a 22,300-mile altitude. At this altitude, the satellite will maintain its position over a given point on the earth.

This repeater system will provide intercontinental point-to-point communications, ground-to-air and ship-to-shore communications, and broadcast-type communications to ground and mobile units on an instantaneous basis. Optimum performance will be achieved by placement of three or four satellites around the equator at equal distances. Adm. Clark said that this system will represent a breakthrough in terms of military communications capabilities.

He also mentioned other satellite projects on which ARPA is engaged. One is the use of a satellite as a navigational aid in the same way that stars are used, with the important difference that the artificial moon's radio signal will be available day and night in any weather. First tests of this system will be in mid-1959, with operational units in a few years. A third program is designed to gather weather information, particularly cloud cover data. A fourth is the use of satellites for an early warning system, presumably for defense against ballistic missiles.

Science News Letter, May 2, 1959

BIOLOGY

Study Life in Antarctica

➤ A RING of teeming ocean life, thousands of miles in circumference, encircles the frigid Antarctica. It is a self-fertilizing, self-supporting aggregation of plants and animals with a membership varying from near-microscopic plankton to sea birds to whales.

The plankton life within the area is about 14 times richer than that in the tropical seas, reports Carl R. Eklund, research analyst with the Army's Polar Research Division, Arlington, Va.

The reason for this proliferation is somewhat controversial, but it appears to have something to do with the movements of ocean water in the Antarctic Convergence, an area from ten to about 50 miles wide encircling the Antarctic at a radius of approximately 2,000 miles with the South Pole in the center.

Some scientists believe the various flows of water meeting at the convergence tend to cause a sinking, leaving plankton at the surface. Other scientists think there is an up-welling of water carrying nutrient phosphates and nitrates up from the depths to nourish the green plankton. A combination of the sinking and up-welling is another plausible theory.

The convergence water is lower in temperature than the waters to the north by three to eight degrees Fahrenheit and it has a slightly lower salt content because of the cold, fresh water coming from glacial icebergs. Ideal living conditions for plankton result.

Mr. Eklund described parts of the area as so thick with phytoplankton that the water is green. Sometimes the small plants, caught in ship filters, smell like freshly cut grass. The phytoplankton serves as food for tiny sea animals known as zooplankton, which in turn are eaten by fish, birds and other sea-going animals.

Mr. Eklund said some areas of the convergence are colored red where red krill abound. These shrimp-like creatures are a major dietary staple for most of the larger animals.

The richness of the waters is not only evident in the red and green colorations. Thousands of birds may be seen wheeling over the feeding "grounds." Mr. Eklund hauled more than 100 cod-like fish out of the water in one hour with a simple fishing rig.

Science News Letter, May 2, 1959

PHYSIOLOGY

Mosquito's Bite Is Aimed At Chemicals in Bananas

➤ MOSQUITOES bite humans to obtain two chemicals that are produced by bananas, a Philippine researcher reports.

It is not blood itself that mosquitoes crave. It is the small amount of serotonin and norepinephrine in the blood that is vital to the life span of this summer pest, Dr. Eusebio Y. Garcia of the College of Medicine, Manila Central University, has reported.

In fact, Dr. Garcia suspects mosquitoes are more attracted to persons who eat foods containing these chemicals. He bases this conclusion on three facts: bananas contain considerable amounts of the two compounds; mosquitoes were less interested in humans who stopped eating bananas; one hour after eating bananas, urine analysis revealed high amounts of waste products that are formed when these two chemicals are used by the body.

Mosquitoes can detect those individuals who have eaten foods containing these chemicals by using their antennae. Banana odors are even present in the perspiration of those persons who eat them, Dr. Garcia explains.

The researcher labeled the two chemicals as the "life blood" of mosquitoes and other blood sucking insects such as fleas and body lice. The functions of these compounds in the mosquito exceed those of hormones that regulate the activities of organs in man.

In fact, these two substances are the main biological factors that make insects fly, eat, breathe, sense their surroundings, reproduce and jump to a height of two feet, Dr. Garcia suggests in the *MD Journal* (Feb.).

Female mosquitoes are equipped with a puncturing device that can penetrate the skin and draw blood. Males have no such equipment to gather these important chemicals, and rely on the amount alloted them at birth. Thus, the female of the species lives an average of nine days while the male survives the adult stage for an average of a few hours, just long enough to participate in the cycle of reproduction of the species.

Science News Letter, May 2, 1959

AERONAUTICS

Flight Plans May Be Filed In Phone by Year 2000

➤ AVIATORS may be able to file a flight plan in the year 2000 simply by inserting a card in the telephone and pressing a button.

That's the forecast of John W. Grewell, deputy chief of systems planning division, Federal Aviation Agency. He told the World Congress of Flight in Las Vegas that machine analysis will determine route and altitude information. Machines will do the job after being told variables such as point of departure, destination, fuel aboard, and take-off time.

Computers will analyze the weather, perform proposed flight within the machine, consider all pertinent stored information, and requirements peculiar to the movement and compare it with other proposed flights taking place at same time.

Then the computers will answer the question of how best to accomplish the flight without conflict with other traffic. To do this, they will consider mission of the operation, existing separation standards, navigational and communication capabilities and airport capacities. Then the results would be relayed to the individual in chart form.

Conceivably the chart could then be used to set up navigational equipment, trigger required communications contacts, and activate other automatic system functions.

Science News Letter, May 2, 1959

EVOLUTION

Natural Selection Still True

➤ NATURAL SELECTION can still explain how the leopard got its spots.

Charles Darwin's theory of natural selection, presented a century ago with the publication of his "The Origin of Species," has run into considerable criticism over the years, Prof. I. Michael Lerner said. However, the University of California geneticist pointed out that many of the objections are a result of mistaken interpretations of Darwin's theory.

Yesterday we spoke of the leopard's spots as being "good" for it. In these terms natural selection acquired a certain moralistic tone, Prof. Lerner explained. Today we understand that factors such as biochemistry or physiology provide a basis for natural selection regardless of the human moral concept of "survival of the fittest."

The only way we can measure survival of the fittest, Prof. Lerner said, is in terms of those animals or plants that leave the most offspring. Offspring that are mediocre or inadequate can be produced through natural selection which has become for many persons simply another name for survival of the fittest.

Now many biologists accept as a definition of natural selection that it is a "nonrandom differential reproduction of genotypes," Prof. Lerner said. This is defining the century-old concept in terms of our current knowledge of genetics.

Individuals with different combinations of genes, different genotypes, thus result from the interaction of many factors. Among these factors are mutation, isolation, environmental conditions, and so on. Actually, Prof. Lerner pointed out, the success of natural selection is largely based on Mendelian inheritance, or the laws governing the role genes play in the individual's make-up.

Concerning man, Prof. Lerner said that he does not believe we have eliminated natural selection as an influence on man. We have, instead, changed the factors that are in operation.

Where the brute strength of the cave man was a factor in the natural selection of offspring, today genes are a more important factor. In simpler terms, as man controls his reproduction more and more, through contraceptive methods for example, a gene for "maternal instinct" could play a very important role in natural selection.

Prof. Lerner gave the opening address at the American Philosophical Society's annual meeting in Philadelphia. The meeting is being held in commemoration of the centenial of the publication of Darwin's "The Origin of Species."

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EVOLUTION

Discuss Darwin's Influence

➤ EVIDENCE to support Darwin's theory that "man is descended from some lower form" was almost non-existent when he published his "The Origin of Species" 100 years ago and his "Descent of Man" in 1871, the famous anthropologist Sir Wilfrid Le Gros Clark, anatomy professor at Oxford University, told the American Philosophical Society meeting in Philadelphia.

Now fossils have been found which provide a record of evolution over the last million years or so, he said. These fossils comprise a graded series which carries human evolution back to ape-like creatures approximating closely Darwin's conception of "connecting links."

"The fact that such discoveries have led to considerable controversy by competent authorities on the question whether these links are properly to be regarded as 'advanced' apes or exceedingly primitive hominids," Sir Wilfrid commented, "is itself an impressive testimony to the essential accuracy of the thesis expressed by Darwin that 'man is descended from some lower form.'"

Darwin based this conception on indirect evidence of comparative anatomy of lower animals and humans, on embryology and by analogy with what was then known of the evolutionary history of other groups of mammals.

Darwin implied prediction that the connecting links would some day be discovered when he said "that those regions which are the most likely to afford remains connecting man with some extinct ape-like creature, have not as yet been searched by geologists."

Darwinism Affected Arts

➤ THE BOOK we read and the sermon we listen to at religious services have also been profoundly influenced by Charles Darwin's theories of evolution.

This influence has not been merely a destructive one as has been commonly thought, two professors pointed out at the Philosophical Society symposium. Darwin positively influenced the arts, religion and all society in some way.

Although he contributed powerfully to the spread of agnosticism, Dr. John C. Greene, professor of history at Iowa State College, said that Darwin contributed to the "philosophical reconstruction" of religion. Darwinian biology emphasized "organism, process, spontaneity, creativity and the like." In this respect, Dr. Greene said, it released religious and esthetic intuitions from the strict bonds of scientific materialism.

In his influence on literature Darwin contributed to contemporary pictures of nature as "blind struggle and universal death." Writers as varied as Tennyson, Hardy, Swinburne, Meredith, Huxley and Spencer reacted to the new biology in many ways—from a starkly realistic view of life to a "rejoicing in upward evolution."

Prof. William Irvine of Stanford University concluded that Darwin gave rise in creative literature to an important religious and philosophical debate that made further debate seem worthless.

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ICHTHYOLOGY

Dolphins Hitch Free Rides On Bow Waves of Ships

➤ BELIEVERS OF the tale that the fun-loving dolphin races alongside ships and leaps playfully in the air for the amusement of mankind are in for some disheartening news.

Studies in dolphin territory by Dr. P. F. Scholander have revealed information that spikes the charming legend. Dolphins are air-breathing animals and they leap out of the water to catch their breaths.

But, do not lose faith in the slithery sea beast, for Dr. Scholander views them as quite clever innovators who allow themselves to be pushed long distances, at little expense of energy, by the bow waves of ships. This is why they seem to be racing with ships.

Dr. Scholander, a physiologist at the Scripps Institution of Oceanography, made these observations during his spare time while investigating the gas content of icebergs near Greenland. His work was sponsored by the Arctic Institute of North America in Washington, D. C.

Aboard the Norwegian sealing vessel, M. S. Rundoy, which was engaged in an iceberg-capturing mission, he tested this theory that dolphins get their push from bow waves by putting their tail flukes at a certain angle in the upwelling water. He put a metal vane about the size of a tail fluke in the bow wave at various angles and measured the push. The force, he figured, was enough to keep dolphins abreast of the ship. He described the dolphin free-ride technique as follows:

"An attentive observer leaning out over the railing can watch them speeding along close to the bow . . . but, unless already briefed, he is likely to miss the fact that the (dolphins) just seem to be 'standing' there motionless, as if getting a free ride.

"Assisted by its pectoral fins, the dolphin steers itself horizontally while he leans his tail fluke against the upwelling water. The water (of the wave) is not only pushed upward and forward, but also outward, and he may ride keeled over on his side."

Dr. Scholander also suggested that the famous little pilot fish, which keeps company with sharks by riding just ahead of their snouts, may employ the same principle. The only way it can keep pace with fast-moving sharks is to ride on the sharks' nose wave.

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OCEANOGRAPHY

Expedition Probes Pacific

Marine biologists have set out on an expedition to explore a mysterious strip in the Pacific Ocean where fish grow to unusually large sizes.

➤ AN EXPEDITION of marine biologists has set out to explore a scientifically mysterious strip in the Pacific Ocean stretching from Panama to Baja California, Mexico. In this area, fish grow to tremendous sizes and disease is virtually unheard of.

All this leads experts to speculate that something may be in the waters there, perhaps brought in by the meeting of swirling northern and southern ocean currents, which could benefit man if the secrets of this ocean area can be unlocked.

It is known fishermen can catch marlin weighing 200 to 250 pounds off San Diego, Calif., waters. But marlin have weighed up to 2,500 pounds when caught in the waters being explored off Central America. Similar size-weight comparisons can be made for other fish. Yellowtails off San Diego weigh about 20 pounds, but off Central America they weigh about 100 pounds.

Equally intriguing to the experts is the apparent good health of these fish. Microscopic examination of the stomachs of fishes caught in this area show no trace of toxic bacteria that normally are found in fish stomachs.

This has led scientists to wonder if the water and its plant life contain some medical ingredient that keeps the fish healthy, extends their life, and perhaps could be found, extracted and used to benefit man.

The expedition is an activity of the Beaudette Foundation for Biological Research, Solvang, Calif. The research ship Stella Polaris will carry cooperating scientists of the Kaiser Foundation, the University of California, and the University of Southern California.

A primary purpose of the expedition, reports the Beaudette Foundation, is to search the ocean floor to find and assay the abundance of marine plants and animals which could be harvested by natives of the Central American Pacific Coast.

Kelp, a source of vitamins, minerals, caloric and other nutrient elements, might prove to be a profitable crop. Like fish, this seaweed grows dramatically in this area, acquiring bases three or four feet in diameter and lengths of 100 feet or more.

Kaiser Foundation scientists are interested in probing the medical mysteries of the ocean in hopes of finding significant contributions to biochemicals and antibiotics.

They will sample the ocean water with filter paper to catch microorganisms fine enough to slip through a 200-mesh net. These microorganisms will be flown in special aerated containers to the Kaiser's Richmond laboratories. There they will be observed for antibiotic qualities. Informally, the scientists are predicting "significant findings" within a year's time.

The University of Southern California will meanwhile be conducting a program aimed at finding natural processes involved in the creation of crude petroleum and natural gas. These raw products are created by nature out of animal, mineral and vegetable material, and apparently with help of bacteria that can activate themselves under ocean-floor pressures.

The University scientists hope to be able to simulate these natural conditions in the laboratory in such a way as to compress the time scale from 100,000 years into months, perhaps even weeks.

Even if they do not succeed in "making" crude oil and natural gas, they do foresee a possibility of soon producing some of the by-products, such as propane, now obtained from these materials.

This expedition is the first step in a long-range program of the Beaudette Foundation to study 15,000 miles of coastal waters from Peru to Mexico. The Foundation indicated identifications of new sea plants and organisms found in this first study will be made available to more than 350 scientific institutions throughout the world.

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PLASTIC LIFEBOAT—A submarine-like hull constructed of glass fiber reinforced polyester sandwiched around foamed polyvinyl chloride makes up the new German lifeboat shown in the photograph. Diesel powered, the boat seats 40 persons and can hold more. It is completely enclosed for maximum protection of the occupants, and it is said, will right itself automatically from any position. Bubble observation domes permit constant lookout for help.

OCEANOGRAPHY

Research Vessel Begins Four-Month Ocean Study

See Front Cover

➤ THE "CHAIN," one of five research vessels of the Woods Hole Oceanographic Institution, has left for a four month's cruise to study the waters and the bottom of the Atlantic and the Mediterranean Sea.

In the photograph on the cover of this week's SCIENCE NEWS LETTER, the new type of underwater camera that was taken on board the R. V. "Chain" can be seen. Dr. R. H. Backus shows the underwater sound apparatus that will bounce an echo from a passing sea animal. At that instant an electronic flash unit will go off and the film in the camera will be exposed.

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MINERALOGY

Russian Gift Identifies Unknown Mineral

➤ A GIFT from Russia has resulted in the identification of an unknown mineral recently discovered along the Green River in Wyoming.

The mineral is labuntsovite, a complex sodium-potassium-barium-niobium-titanium silicate, first recognized by Russian mineralogists in 1955. A year later material like it was found in Wyoming by geologists of the Geological Survey.

A Moscow professor brought a sample of the mineral here for comparison with the Green River find, and the two minerals were found to be the same.

Labuntsovite is of special interest to earth scientists because it is one of several rare species found in the Green River sedimentary (water deposited) rocks that, elsewhere in the world, are found only in igneous (molten) rocks.

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MEDICINE

Body Wastes Help Spread Protection From Polio

➤ BODY WASTES can act as an "immunity bridge" in spreading protection against polio, a Tulane University researcher reported.

Doses of a safe, living polio virus vaccine were administered orally to one person in each of 56 families in New Orleans. Blood and body waste specimens from family members were studied for immune antibodies and for viruses. The results showed that individuals who did not receive the oral vaccine acquired the same immunity to polio as the individuals who did receive it, Dr. Henry M. Gelfand told scientists at the Federation of American Societies for Experimental Biology meeting in Atlantic City, N. J.

Viruses were spread in many cases by contact with objects or food handled by the vaccinated persons who did not wash their hands properly after using the bathroom.

The viruses spread to non-naturally immunized (susceptible) persons twice as frequently as they did to those who had some resistance due to prior exposure to polio, Dr. Gelfand said.

Economic status seems to play an important role in the spread of virus, he said. In the lower income class, 53% of those susceptible caught the virus, while only nine percent in the upper income families caught the immunizing virus.

The study indicated the spread was usually from child to child rather than from child to adult or adult to child. "One child carrying the virus spread it to two playmates in a period of two hours," Dr. Gelfand said.

Drs. John P. Fox and Louis Potash and Miss Dorothy R. Leblanc were associated with Dr. Gelfand in the year-long study.

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PSYCHIATRY

Pleasure and Pain May Be Related

➤ AS THE INTENSITY of human pain grows, a certain pleasurable sensation may become associated with it.

This was suggested by Dr. Norbert Bromberg, associate clinical professor of psychiatry at the Albert Einstein College of Medicine, in describing his views on masochism, the derivation of pleasure as a result of physical or psychological pain. He spoke at the annual meeting of the American Psychoanalytic Association in Philadelphia.

To demonstrate his point, Dr. Bromberg used the example of the pain mechanism associated with the skin.

"Here," he said "the same nerve endings, when mildly stimulated, give rise to the pleasurable sensation of stroking, when more intensely stimulated produce itch, a combination of pleasure and pain; and when still more intensely stimulated, cause the sensation of pain."

Since it is a generally accepted physiological law that stimulation of a given sense organ causes only one specific sensation, Dr. Bromberg suggests that some reaction in the brain might produce the pain-pleasure effect. Specifically, he thought that excessive stimulation might cause a "damming back" of the stimuli with attendant pain-pleasure feelings. He did not point out the exact nerve mechanisms that may be involved.

As far as the psychological pain-pleasure system is concerned, Dr. Bromberg theorized that a masochistic personality develops in the following way:

Whenever a child is subjected to severe and inescapable frustration or other painful experiences, he tries to extract from them whatever pleasurable sensations he can. He may learn to get satisfaction out of the sudden cessation of pain. Or a gradually diminishing pain-producing stimulus may become gentle enough to cause pleasurable psychological feelings.

In being forced to endure frequent psychologically painful experiences, the child may grow to adulthood seeking his pleasure from them.

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METEOROLOGY

Method Developed for Forecasting Sea Surges

➤ THE DAMAGING sea surges that often smash into Barbados and other islands of the Lesser Antilles in the Atlantic can now be forecast two or more days in advance.

Drs. William L. Donn and William T. McGuiness of Columbia University's Lamont Geological Observatory suggested development of the forecast method to the U. S. National Committee for the International Geophysical Year. It would be based, they reported, on locations of large storms far from the islands, as shown on weather charts, following the appropriate travel time for the storm-generated swell.

Islands of the Lesser Antilles, particularly Barbados, the easternmost, have long been plagued by severe and damaging sea surges. These are swells having periods usually between about 30 seconds and one hour, mostly less than four inches high in the open ocean.

The sea surges may continue for a day or more. They arise with little warning and are unrelated to local weather. Attempts to explain them in terms of submarine landslides or earthquakes have proved unsuccessful.

Four occurrences of sea surges have now been explained by studies of data collected as part of the IGY island observatory program in the Atlantic. Intense North Atlantic storms in which the distance the wind blows over the water in a particular direction is specified can generate long-period ocean swells having periods of 15 to 20 seconds that spread toward the Lesser Antilles.

If the swell maximum arrives at low tide, much of its energy is expended on the outer reefs. If it arrives at high tide, particularly spring high tide, the long-period swell crosses the reef and develops high and damaging surf at the shore. If the swell maximum lasts a long time, surf conditions vary with the tide until the swell subsides.

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IN SCIEN

MEDICINE

Police Have Another Tool To Identify Human Blood

➤ POLICE investigators have been given a new scientific way to prove that the blood stain is human even when it is old, well-scrubbed, or invisible.

To get a positive identification of human blood, a way of activating the fibrinolytic enzyme system of blood stains was worked out by two scientists at the Medical University of Szeged's Institute of Forensic Medicine, Szeged, Hungary.

The method works even if blood-stained linen has been washed in warm water with soap so that no trace of the blood stain can be seen. In experiments, the washed linen pieces even gave a positive reaction two months later. Blood stains of various domestic animals, both mammals and poultry, did not give reactions. The test thus gives proof of human blood only.

The fibrinolytic enzyme system in blood can be activated outside the body by extracts of chloroform and bacteria.

"Knowing this," report E. Szollosy and B. Rengey in the German scientific journal, *Die Naturwissenschaften* (March 1), "we asked whether we could identify human blood traces."

Using the technique, the two scientists got a "very positive reaction" with human blood drops that had dried for eight months at room temperature on metal, glass, and linen. The scientists envision the new method could serve as an addition to customary serological examinations which have their "difficulties and possibilities of faults."

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AERONAUTICS

"Pancake" Airport Light To Be Tested Soon

➤ A NEW LIGHT that looks like a pancake will be tried out experimentally at the May 9 "fly-in" to be held in Atlantic City, N. J., for owners of private planes.

The light is competing with several others under a research and development program of the Federal Aviation Agency aimed at finding better lights for commercial and non-commercial airports.

The pancake is designed to be installed along the center lines of taxiing areas and runways. It stands ¾-inch high and airplanes can land on it without harming their landing gear, the FAA said.

A channel in the fixture lets light from its 45-watt bulb shine fore and aft, but not to the sides.

The FAA said it has at least five other types under consideration.

Pilots attending the "fly-in" will be briefed on other developments, such as anti-collision lights, computers, simulators, and mock-ups of simulators.

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CE FIELDS

RADIOLOGY

Enzyme Systems May Be Radiation Damage Areas

➤ AN ENZYME system in the cell nucleus, rather than long-suspected genes, may be the critical area of radiation damage to certain sensitive tissues.

This is pointed out by Drs. Ole A. Schjeide, James F. Mead and Lawrence S. Myers Jr. of the Department and Laboratories of Nuclear Medicine and Radiation Biology at the University of California, Los Angeles.

Critical gene systems, which have been exposed to eons of background radiation and mutations, do not seem likely candidates for high radiation sensitivity, the UCLA scientists point out. Such exposure should have molded them into relatively radio-resistant structures.

More likely suspects for the focal point of radiation damage are supporting enzyme systems of the cell nucleus, possibly sulfhydryl containing enzymes. These enzymes, which are important to growth and cell division, normally lead a chemically sheltered life in the nucleus.

When they are exposed to chemical culprits known as free radicals, unleashed by radiation action on tissue water, they may be inactivated through oxidation and permanently lost to the cell nucleus.

If these enzymes can definitely be identified as the key system in radiation damage, steps might be taken to reverse the action, the investigators point out. Antioxidants will reverse the inactivation of the enzymes in the test tube. This gives hope that this might be accomplished in the nucleus of cells.

Science News Letter, May 2, 1959

MEDICINE

Lack of Exercise Suspected As Heart Disease Cause

➤ LACK OF EXERCISE is a threat to western civilization, five medical researchers reported.

The physical inactivity that is characteristic of western nations is being increasingly suspected of being one of the most important causes of heart and degenerative diseases and fatal heart attacks, the doctors, from four countries, reported at the meeting of the American College of Physicians in Chicago.

"In terms of the natural biological characteristics of the human race, as it has presumably existed for thousands of years, it is not the so-called 'athlete's heart' which should be considered abnormal but rather the degenerating, inadequate 'loafer's heart' of our present day civilized majorities," the five explained. They are Drs. Wilhelm Raab and Yvonne K. Starcheska, University of Vermont College of Medicine, Dr. Eiichi Kimura, Japan Medical College, Dr. Paulo de Paula Silva, University of Sao Paulo Faculty of Medicine, Brazil, and Dr. Hans Marchet, University of Innsbruck, Austria.

Highly competitive athletes, Austrian mountaineers, Alpine soldiers and sedentary individuals were examined and tested. The researchers found a marked decline in the heart protecting mechanisms in proportion to the decreasing exercise habits.

"Fortunately, this condition is reversible, and in 20 more or less sedentary men a six- to 12-week period of vigorous physical retraining restored the vagal tone (action of the nerve carrying impulses to the heart and other organs of the body) toward normal," they said.

Other influences on the heart are socio-economic pressures and emotional conflicts and tensions.

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CHEMISTRY

"Missing" Enzyme Sought That Fools Cancer Cells

➤ HOW TO FIND the missing enzyme and end drug resistance in some cancer cells is the current project of research teams from two cancer research laboratories.

Cancer cells that lack a particular, as yet unknown, enzyme are resistant to several anticancer drugs, the researchers told scientists at the Federation of American Societies for Experimental Biology meeting in Atlantic City. They have discovered the exact mechanism by which one drug, 6 MP, kills cancer cells. Other drugs, the scientists believe, probably work in the same way.

What happens is this: inside the cancer cell, 6 MP attaches itself to a sugar-phosphate molecule with the help of the unknown enzyme. Together, the complex molecule of 6 MP, sugar and phosphate, resembles compounds needed by the cell for the manufacture of nucleic acids. The cancer cell, "fooled" into using the drug compound, no longer can make nucleic acid and eventually dies.

A few cells, however, lack the enzyme that attaches 6 MP to the sugar-phosphate and thus the drug is ineffective. In the living organism these resistant cells continue to multiply until they are the only ones left. When this happens the drug can no longer be used in cancer therapy.

This mechanism seems to explain why about one-third to one-half of the children with acute leukemia are helped by 6 MP and later suffer relapses.

Discovering a substitute for the missing enzyme or identifying it could provide a way to cure or permanently control acute leukemia, the scientists believe.

Drs. M. E. Balis, Dorris J. Hutchison and Josephine S. Salser of the Sloan-Kettering Institute for Cancer Research, New York, and Drs. R. W. Brockman and H. E. Skipper of the Southern Research Institute, Birmingham, Ala., reported the research. Dr. Alexander Hampton of Sloan-Kettering is currently attempting to synthesize a compound that combines the missing enzyme with the 6 MP-sugar-phosphate combination.

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PHYSICS

Operation of First U. S. H-Bomb Described

➤ HOW THE first U. S. hydrogen bomb worked has been figured out by a Canadian scientist.

It consisted of a uranium or plutonium fission bomb, surrounded by a liquid deuterium-tritium mixture that was, in turn, surrounded by a layer of natural uranium. The central fission bomb was exploded first, raising the temperature of the refrigerated deuterium-tritium liquid to at least 50,000,000 degrees, much hotter than the sun's interior. The heavy uranium outside layer held the refrigerated liquid in place until it was heated to this star-like temperature.

The U. S. Atomic Energy Commission exploded the fusion bomb device of Operation Mike in November, 1952, on an island in the Pacific Ocean. An intense source of neutrons was thus released, irradiating the uranium, which then formed many new substances. Two elements, now named einsteinium and fermium, were identified as a result of this test.

Dr. A. G. W. Cameron of Atomic Energy of Canada Limited, Chalk River, Ontario, says the Mike explosion was a "unique and important scientific experiment," because later fusion explosions did not produce the heavy concentration of neutrons available from the Mike device.

Although few details of the Mike explosion have been made public, Dr. Cameron's description is his educated guess.

Dr. Cameron reports in the *Canadian Journal of Physics* (March) that more recent fusion explosions have used mixtures of lithium and deuterium.

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MEDICINE

Case of Mistaken Identity For Unusual Tapeworm

➤ WHEN THE worm turns, if it is a tapeworm inside an animal or a man, there may be a problem of mistaken identity for the scientist to solve.

Two McGill University researchers report that the host, either a man or animal, may affect the size and shape of the tapeworm so greatly that the worm is not correctly identified. This has led, they said, to incorrect diagnosis of tapeworm infections.

An example of this is the report of two tapeworms taken from a young Indian boy. They were identified as fish tapeworms. Later, however, while the boy was hospitalized, a tapeworm said to be Taenia, found in beef and pork, was taken from him. Further examination revealed that this third tapeworm was also a fish tapeworm, only an abnormal one.

This may be a result of the treatment given the boy affecting the growth of the tapeworm, Gloria A. Webster and T. W. M. Cameron report in the *Canadian Journal of Zoology* (April).

Science News Letter, May 2, 1959

AGRICULTURE

Seaweed Comes to the Land

Recently, with the growth of scientific understanding of these primitive, yet mineral-rich plants, seaweed meal as a nutritive additive has caught the fancy of the American farmer.

By RICHARD LITELL

➤ PLANTS FROM the sea are helping farmers raise better livestock and grow better crops.

Widely distributed throughout the earth's 329,000,000 cubic miles of salt water are some 17,000 species of seaweed.

Many of these weeds have been used by men of many lands and many civilizations for centuries and even millenia, chiefly as animal fodder, fertilizer and food.

Some seaweeds are said to have been considered of medicinal value in the Orient in the time of Shen Nung, as far back as 3,000 B.C., and even today seaweed is enjoyed as a substantial part of the vegetable diet of many Oriental countries.

Only comparatively recently, however, with the growing awareness of its nutritive potential, is seaweed finding rapidly growing use in this country as an additive for fodder and fertilizer.

Seaweeds may be just weeds in the ocean, but on land they have become highly regarded plants, recognized as being extremely rich in vitamins, minerals and amino acids.

Most of the seaweeds belong to a group of lower plant life known as algae, and they range in size from microscopic single cells to huge plants, longer even than the giant redwoods are high.

The algae, which differ from higher plants in that they do not possess true roots, stems or leaves, are commonly classified by colors. Four groups—green, blue-green, red and brown—are recognized. Only the brown and red are presently of economic importance.

Algae and Seaweeds

The brown and red seaweeds may grow in the same geographical areas but, generally, the browns flourish in cold water while the reds grow most abundantly in warmer, deeper waters.

Sea water, comprising 70.8% of the earth's surface, is the final collector of all mineral run-off from the land and contains at least 49 of the earth's 102 elements.

Small wonder then that this exceptionally rich life-supporting medium gives rise to equally rich plants.

The composition of seaweed differs considerably from that of land plants. When seaweed is burned, its ash content, for example, is much higher than that of land plants. A high ash content is favorable in a fertilizer but less desirable in a fodder. In the latter, it should not exceed 16.5%.

Vitamin content is especially high, while fat and protein content is about the same as for vegetation generally. Seaweed is rich in carbohydrates, but these differ from those found in land vegetation.

Seaweed products may be divided into two groups, derived and natural.

Derived products, chiefly colloids, are used primarily as thickeners, gelling agents and film firmers, and can be combined with foods without impairing their flavor. Specific uses include stabilizing icings, chocolate milk and ice cream; gelling desserts and starch-base milk puddings; thickening cosmetic and medicinal creams, and providing roughage in medicinals, breakfast foods and bakery products.

The U. S. sales volume of colloids jumped from $2,000,000 in 1945 to $10,300,000 in 1955, and the projected level for 1975 is $20,000,000.

But although the derived products are of primary economic value, the products for which the demand has grown rapidly in this country are the natural products—animal food and fertilizer.

It was the natural products that were used by the ancients and it is the natural products that are finding increased application here because modern science is helping to find out what seaweeds are made of and how their ingredients can best benefit other forms of life.

In this country, seaweed meal, or kelp meal as it is generally called, is being used as fertilizer and fodder additives by farmers of all sorts, as well as raisers of cattle, hogs, cows, chickens, turkeys, horses, mink and sheep. Results, although largely unofficial, are encouraging, even startling.

(Although in Europe the ashes of seaweeds are called kelp, it is generally the larger brown seaweeds, as well as their ash, that are referred to as kelp in this country.)

Chief U. S. and only nation-wide supplier of kelp meal is the Algit Norwegian Kelp Meal Co. of Chicago. Its meal is made from a specific species of brown seaweed, *Ascophyllum nodosum*, found along the Norwegian coast and harvested there under strict Government supervision.

This meal is said to contain 5.7% proteins, 2.6% fats, 58.6% nitrogen-free extract matter, 10.7% moisture and 15.4% ash. It also contains vitamins A, B-1, B-2, B-12, C and seven other vitamins, in addition to 21 amino acids.

But it is the high mineral content that is the important property. Sixty mineral and non-mineral elements, from silver, aluminum and gold to sulfur, tungsten and zinc, are to be found in the meal.

Seaweed for Mink

In an experiment with 200 Royal Pastel mink, Dr. John A. Miller, head of the zoology department at Ohio State University, and Thomas F. Daly of the same department, reported that addition of one percent kelp meal to a standard ranch ration resulted in a saving of 1,228 pounds of food for mink over a 135-day period—a nine percent saving.

HARVESTING SEAWEED—Seaweed harvester gathers sun-dried masses of brown seaweed (Ascophyllum nodosum) *from the rocks along the rugged coast of Norway. Spread there to dry to 20% water content, the seaweed is subsequently cleaned, partially desalted and then ground into a meal for use as a fodder and a fertilizer additive.*

The kelp-fed mink weighed 5.3 ounces more per mink and averaged 1.1 inches more in pelt length than control mink. Pelts from the kelp-fed mink were valued at three to four dollars more per pelt.

In other words, the kelp-fed mink gained more pounds on less food and produced larger pelts of greater value than mink fed the identical diet without kelp.

Dr. Miller has stated that Norwegian kelp is "far superior to domestic in amino acids, minerals and vitamins." This is probably due to a combination of factors—the mineral-carrying Gulf Stream, the fiords feeding in mineral runoff from the land, the constant temperature, and regular harvesting under Government quality control.

Although few other officially published experiments as yet attest to the high nutritive value of kelp meal in this country, scores of unsolicited reports tell of some of the remarkable results achieved with kelp.

—About 100 leading horse stables, such as Maine Chance, owned by Elizabeth Arden, and Danada, use kelp as feed additive.

—A Pennsylvania chicken farmer found that laying hen mortality decreased, egg size increased, and cecal worms decreased after three months on two percent kelp meal.

—A 35% to 50% increase in commercial tomato yield was noted by a Maryland farmer who fertilized his crop normally and mulched with kelp meal.

Controlled Experiments Made

A number of controlled experiments with seaweed meal are currently in progress. Among the investigators are Dr. Cecil Howes of Virginia Polytechnic Institute (poultry); Dr. Damon Catron, Iowa State College (swine); Dr. William J. Tyznik at Ohio State (ruminants), and Dr. T. L. Senn of Clemson Agricultural College (horticulture).

Exactly how kelp meal accomplishes its beneficial results is not known. Some scientists are convinced of the presence of an unknown growth factor in addition to the vast storehouse of vitamins and minerals.

Not having a particularly great caloric value, kelp is not a feed or fertilizer in itself, but merely a nutritional additive.

The Algit Company makes no claims, only points to the results. And the results are telling the story. The firm sold 1,500 tons of kelp meal last year, and so far this year they have more than tripled that figure.

A world growing at the rate of 5,400 persons per hour, which has been warned that it must look increasingly to the sea as a source of food, would do well to honor the "lowly" seaweed. It will have a big role to play.

Science News Letter, May 2, 1959

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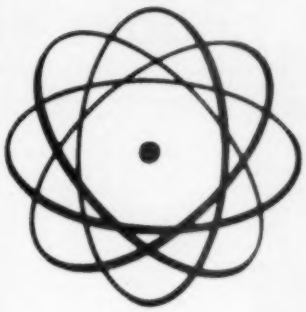

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For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ACCREDITATION IN HIGHER EDUCATION—Lloyd E. Blauch, Ed.—*U. S. Office of Educ. (Govt. Print. Off.)*, 247 p., paper, $2.50. Brings together formerly widely scattered information in a modern reference source on accreditation.

THE AUTOBIOGRAPHY OF CHARLES DARWIN AND SELECTED LETTERS—Francis Darwin, Ed.—*Dover*, 365 p., paper, $1.65. Reprint of first U. S. 1892 edition published by Darwin's son.

BIG MAC: The Building of the World's Biggest Bridge—Dirk Gringhuis—*Macmillan*, 32 p., illus. by author, $2.50. Ages 8-12.

THE COMPTON YEARBOOK FOR 1959—Leroy Hayman, Ed.—*Compton*, 288 p., illus., paper, $6. A summary and interpretation of the events of 1958. Supplements Compton's Pictured Encyclopedia, science articles written by Science Service.

THE DESIGN OF LAND DRAINAGE WORKS—Roland Berkeley Thorn—*Butterworths (Canada)*, 235 p., illus., $7. Collection of papers selected, annotated and arranged in the form of a design handbook.

DICTIONARY OF GUIDED MISSILES AND SPACE FLIGHT—Grayson Merrill, Ed., C. W. Besserer, Krafft A. Ehricke and Ballard B. Small, Contrib. Eds.—*Van Nostrand*, 688 p., illus., $17.50. Compendium of commonly used terms, their definitions and explanatory statements, covering aerodynamics, astrodynamics, electronics, astronomy and physics.

THE DOCTOR WHO DARED: William Osler—Iris Noble—*Messner*, 192 p., $2.95. Biography for young people.

EARTHQUAKE HISTORY OF THE UNITED STATES, Part 1: Continental United States and Alaska (Exclusive of California and Western Nevada)—N. H. Heck, rev. through 1956 by R. A. Eppley—*Govt. Print. Off.* for U. S. Coast & Geodetic Survey, 80 p., map, paper, 60¢.

ELEPHANTS: A Short Account of their Natural History, Evolution and Influence on Mankind—Richard Carrington—*Basic Bks*, 272 p., illus., $5. Comprehensive survey of elephant science and elephant lore.

EVERYDAY LIFE IN EGYPT: In the Days of Ramesses the Great—Pierre Montet, transl. from French by A. R. Maxwell-Hyslop and Margaret S. Drower—*St Martins*, 365 p., illus., $8. Reconstructs life during the 19th and 20th dynasties (c. 1320-1100 B.C.) from papyri and evidence of buildings.

FAMILY AND CLASS DYNAMICS IN MENTAL ILLNESS—Jerome K. Myers and Bertram H. Roberts—Wiley, 295 p., $6.95. Investigates the relationship of social and psychodynamic forces to psychiatric illness in the lower middle and lower classes.

FORERUNNERS OF DARWIN: 1745-1859—Bentley Glass, Owsei Temkin and William L. Straus, Jr., Eds.—*Johns Hopkins Press*, 471 p., illus., $6.50. Of the scientists and philosophers whose writings played a major role in making Darwin's achievement possible.

THE INDIVIDUAL AND THE UNIVERSE—A. C. B. Lovell—*Harper*, 111 p., illus., $3. Survey of advances in astronomy, from Galileo to the development of radio telescopes, including discussion of various theories of the origin of the universe.

LESSONS OF THE RECESSIONS—W. S. & E. S. Woytinsky—*Public Affairs Inst.*, 102 p., illus., paper, $2. Analysis of three postwar recessions and recommendations for preventing future recessions.

LET THERE BE LIGHT—Lillian J. Bragdon—*Lippincott*, 91 p., illus., by Leonard Shortall, $2.75. Acquaints young boys and girls with man's effort to conquer darkness.

LET'S GO FOR A NATURE WALK—Joan Rosner—*Putnam*, 48 p., illus. by Betty Harrington, $1.95. Tells of what young boys and girls can observe about trees, flowers, insects, birds and minerals.

LIVING EARTH—Peter Farb—*Harper*, 178 p., photographs by Roman Vishniac, drawings by Louise Katz, $3.75. Of the hidden world of grubs, nematodes, termites, earthworms and others working in the soil.

NATIONAL SCIENCE FOUNDATION, NATIONAL ACADEMY OF SCIENCES: Report on the International Geophysical Year—Joseph Kaplan and others—*Committee on Appropriations* Hearings, 86th Congress, 200 p., illus., paper, free upon request direct to Committee, House of Repres., Washington 25, D. C. Review of Antarctic program, research on cosmic rays, gravity, meteorology, oceanography, satellites and other phases of the IGY.

NATURAL RESOURCES: Their Protection and Development—Dewey Anderson and Associates—*Public Affairs Inst.*, 48 p., paper, 50¢. Review of our conservation program with a view to the next 50 years.

NAVY SURGEON—Herbert Lamont Pugh—*Lippincott*, 459 p., illus., $5. Autobiography of Rear Admiral Pugh, ex-Surgeon General of the U. S. Navy.

OUR GROWING WATER PROBLEMS—R. G. Lynch—*National Wildlife Federation*, 61 p., paper, single copies free upon request direct to publisher, 232 Carroll St., NW, Washington 12, D. C.

POLYMERS AND RESINS: Their Chemistry and Chemical Engineering — Brage Golding — *Van Nostrand*, 744 p., illus., $15. Comprehensive volume covering the theory, chemistry, properties, fabrication and application of commercial polymers and resins.

POPULATION PRESSURES IN AFRICA SOUTH OF THE SAHARA—Richard W. Stephens—*George Washington Univ.*, 48 p., paper, $1. Focuses on the various problems raised by the increasing pressure of population on the resources of this region.

PREHISTORIC LIFE—Matthew F. Vessel and Herbert H. Wong—*Fearon*, 16 p., illus., paper, 75¢. Science education material explaining fossil formation and identification, with "Time Table of the Earth" chart.

PROFESSIONAL CREATIVITY—Eugene K. Von Fange—*Prentice-Hall*, 260 p., $4.95. Shows how creative talent may be more fully used, and discusses in detail the planning of creative work, based on experience gained in conducting creative engineering classes at the General Electric Company.

PROGRAM FOR COLLEGE PREPARATORY MATHEMATICS—Commission on Mathematics, Albert W. Tucker, Chmn.—*College Entrance Examination Bd*, 63 p., paper, $1. Proposes the kind of mathematics which should be studied by today's college-bound American youth.

RESEARCH IN SPACE SCIENCE: Special Report No. 22—Yoshihide Kozai—*Smithsonian Astrophysical Observatory*, 10 p., paper, single copies free upon request direct to Observatory, Cambridge 38, Mass.

SCIENCE, GRADES K-6, VOL. 2: Earth in Space—Florence S. Beaumont and others—*Bd. of Educ., City of N. Y.*, 55 p., illus., paper, 50¢. Handbook for grade school science teaching, emphasizing child's direct observations. Bibliography of books and filmstrips included.

SCIENCE INFORMATION NEWS, Vol. I, No. 1—National Science Foundation—*Govt. Print. Off.*, 16 p., paper, 25¢, annual subscription $1.25. Reporting national and international developments in scientific and technical information.

SELECTED MATERIALS ON ATOMIC ENERGY PATENTS, Vol. I—U. S. Congress, Jt. Comm. on Atomic Energy—*Govt. Print. Off.*, 289 p., paper, 70¢. Background information for public hearings, including draft of legislation prepared by AEC, which would extend compulsory licensing requirement for five years.

SELECTED MATERIALS ON FEDERAL-STATE COOPERATION IN THE ATOMIC ENERGY FIELD—U. S. Congress, Jt. Comm. on Atomic Energy—*Govt. Print. Off.*, 520 p., paper, $1.50. Contains previously unpublished study "Federal and State Responsibilities for Radiation Protection: The Need for Federal Legislation."

SOUND AND ULTRASONICS—Robert Irving—*Knopf*, 150 p., illus. by Leonard Everett Fisher, $2.75. Explains the phenomena of sound, illustrated with simple experiments. 10 years and up.

(Continued on page 286)

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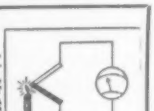

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Alexander Graham Bell's interest in deafness and hearing led to the invention of the telephone. Bell Laboratories' current explorations in binaural sound may well lead to important new advances in the transmission of speech and music.

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(Continued on page 286)

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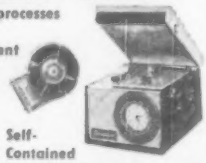

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Books of the Week

(Continued from page 284)

SOVIET SPACE SCIENCE—Ari Shternfeld, foreword and epilogue by Willy Ley—transl. from Russian by Tech. Doc. Liaison Off., U. S. Air Force—*Basic Bks,* rev. ed., 361 p., illus., $6. A survey of astronautics from the Russian point of view. Acquaints reader with Russian work and plans up to the end of 1957.

STATISTICAL YEARBOOK 1958—U. N. Statistical Office—*United Nations (Columbia Univ. Press),* 10th ed., $8, paper: $6.50. Over 150 countries or territories submitted their national statistics for inclusion, making this the most comprehensive yearbook in the series.

THE STORY OF THE PLATYPUS—Alfred G. Milotte—*Knopf,* 114 p., illus. by Helen Damrosch Tee-Van, $2.75. Story of one of Australia's "living fossils" for young readers 9-12.

THIRTY YEARS OF RESEARCH IN HUMAN FERTILITY: Retrospect and Prospect—John Hajnal and others, foreword by Frank G. Boudreau and Clyde V. Kiser—*Milbank,* 157 p., paper, $1. Papers presented at the 1958 Annual Conference of the Milbank Memorial Fund.

TOMMORROW, THE MOON! Planes, Missiles, Satellites, Space Travel—Abraham and Rebecca B. Marcus—*Prentice-Hall,* 150 p., illus., $3.50. Presents the complexities of space technology in simple language for the general reader.

TOXICOLOGY AND APPLIED PHARMACOLOGY, Vol. I, No. 1—Harry W. Hays, Frederick Coulston and Arnold J. Lehman, Eds.—*Academic,* 118 p., paper, bi-monthly, 6 issues $13. For toxicologists, biochemists, nutritionists, veterinarians and others.

THE UNKNOWN OCEAN—Amabel Williams-Ellis—*Putnam,* 72 p., illus. by Robert Eggers, $2. Introduces boys and girls to ocean life and explorations.

VOLCANOES AND GLACIERS: The Challenge of Iceland—Sturges F. Cary—*Coward-McCann,* 96 p., illus., $2.50. Gives young people an idea of Iceland and its importance to the United States.

WHITEFOOT MOUSE—Barbara and Russell F. Peterson—*Holiday,* 53 p., illus. by Russell F. Peterson, $2.50. The story of a woodland community at night in winter told for young children.

WHO LIVES IN A FIELD—Duryea Morton—*Coward-McCann,* 127 p., illus. by Douglas Howland, $3. Of the habits and encounters of small field animals, told for ages 7-11.

THE WORLD OF INSECTS—Paul Pesson, transl. from French by R. B. Freeman—*McGraw,* 204 p., 225 photographs, $15. Exciting color photography makes this a beautiful book about those highly diversified and prolific creatures which make up two thirds of all animal species in existence.

WORLD POPULATION PRESSURES—Harold L. Geisert—*George Washington Univ.,* 46 p., paper, $1. General introduction, correlating the social and cultural with the demographic and economic characteristics of underdeveloped countries.

Science News Letter, May 2, 1959

Questions

BIOLOGY—What two animals are helping scientists study atherosclerosis? p. 275.

MINERALOGY—Why does labuntsovite interest earth scientists? p. 279.

PHYSIOLOGY—What chemicals do bananas contain that mosquitoes need? p. 277.

Photographs: Cover, Woods Hole Oceanographic Institution; p. 275, Veterans Administration; p. 279, Reichhold Chemicals, Inc.; p. 282, Government of Norway; p. 288, Eastman Chemical Products, Inc.

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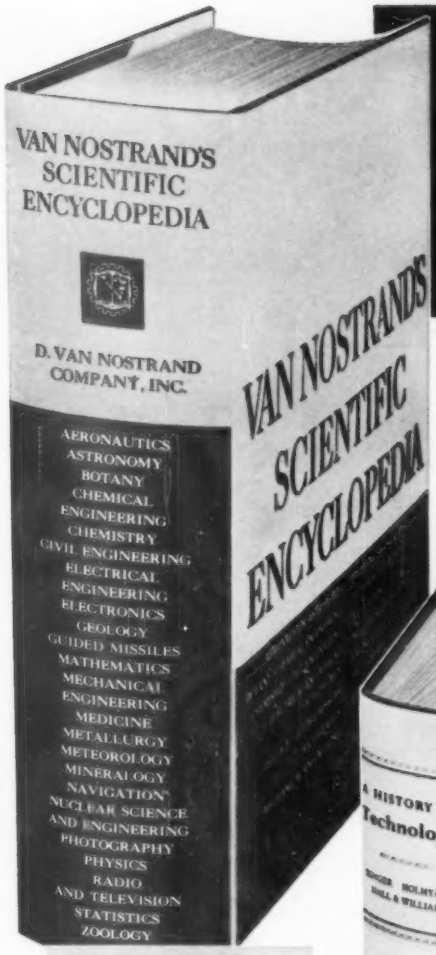

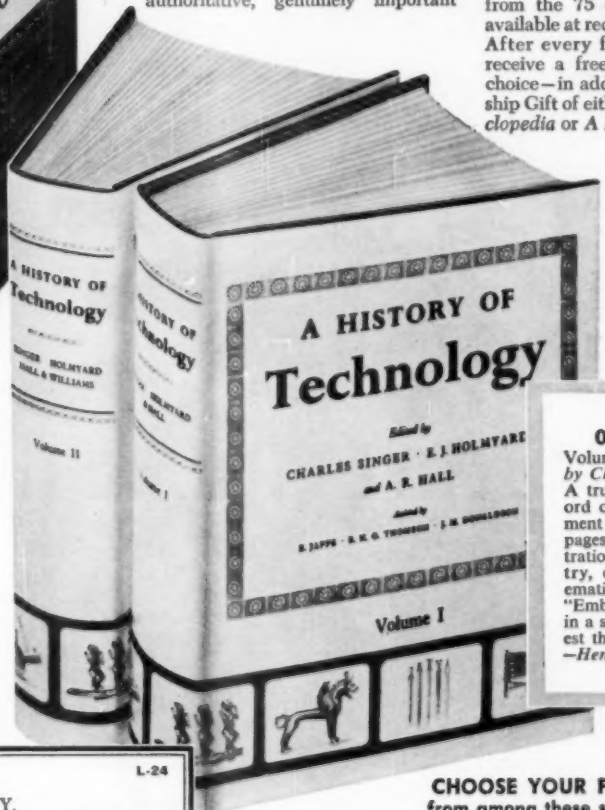

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TOY SATELLITE is a star-sprinkled blue plastic sphere that pilots itself electronically for the amusement of young and old space-agers. Two flashlight batteries power a "brain" that keeps the toy rolling around all obstacles in its path. The satellite also emits an audible beep.

Science News Letter, May 2, 1959

PLASTIC COLORED DOTS, one-quarter inch diameter, are self-adhesive and come in 12 colors, 136 to a card. A slight finger pressure makes them stick to metal, paper, plastic, glass, wood or other clean, dry surface. They can be used to mark maps, charts and floor plans; to flag inventory cards; and as a color code for knobs and buttons.

Science News Letter, May 2, 1959

MATTRESS VIBRATOR bolts to bed slat and can be plugged into normal house circuit. It produces gentle oscillations, and can also be installed on sofas, chairs and baby cribs. It weighs four pounds, has a non-exposed 115-volt, 60-cycle motor, and is equipped with a base and ten feet of cord.

Science News Letter, May 2, 1959

PLASTIC GAVELS for committee, lodge or board meetings are ivory colored, strong and impact resistant. Made in sizes

for men or women, the gavel, shown in the photograph, can also be supplied with silver or bronze bands for engraving dates or messages.

Science News Letter, May 2, 1959

ICE CUBE RETAINER for drinking glass consists of a plastic strainer that fits into the glass and a looped handle that fits over the lip of the glass. The retainer keeps ice away from teeth and lips when drinking and provides deeper immersion of ice in the drink.

Science News Letter, May 2, 1959

SLING SHOT of transparent plastic is hollow and holds 500 BB's. A release button in the fork feeds pellets from the bottom of the handle into the leather pouch of the gum rubber pull.

Science News Letter, May 2, 1959

PROJECTION STAND for film projectors is 48 inches high and has two platforms with insulated formica tops. The top platform can be raised or lowered. Able to support 300 pounds, the tubular steel stand also has a reel holder for spare film. Safety locks prevent the platforms from collapsing and an anti-tripping device guards against accidentally upsetting the stand.

Science News Letter, May 2, 1959

WEATHER INSTRUMENT for home, *farm, office window, garage or boat indicates temperature, rainfall, wind speed and wind direction. Constructed mainly of plastic, it can be easily mounted. Precipitation is recorded in a graduated tube. Wind speed indicator pivots along a scale to show velocity in miles per hour.*

Science News Letter, May 2, 1959

Nature Ramblings

By HORACE LOFTIN

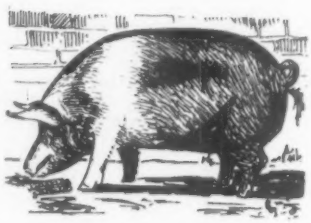
The Teeth of the Matter

▶ THE FINE set of teeth of the alligator performs its function wonderfully well.

They are sharp, stout, peg-like, just right for grabbing and holding on to the prey until it is ready to be gulped down, whole or in pieces. But as in all the vertebrate animals with teeth, exclusive of the mammals, its teeth are essentially all alike.

The mammals, on the other hand, are characterized by having teeth of several kinds in each individual. For example, man has incisors in front for biting, rather degenerate canines for stabbing and holding, and premolars and molars for chewing and grinding. There are exceptions to this generality, of course, but they are few.

Each mammalian group or species has, as a rule again, its own particular kind of dentition; its incisors, canines, premolars and molars are so modified, or lacking, as to fit its particular feeding habits. Man is an omnivorous mammal, and his teeth re-



flect this by being quite generalized—no one kind of tooth outstrips the other in size or importance. Another familiar mammal, the hog, with "similar" omnivorous habits carries a set of teeth remarkably like our own.

The rodents are gnawing animals. As might be expected, the front incisors are extremely well developed and specialized. Canines, which would be virtually useless to rodents, are completely absent. Premolars and molars are present for grinding. The incisors of rodents grow continuously throughout life, being worn down (and kept sharp) by the opposing incisors on the opposite jaw as well as by hard usage.

The carnivorous or meat-eating mammals usually have reduced incisors, but highly developed canines. These teeth are useful in killing and holding the prey. Canines reached their peak with the great saber-toothed tiger, whose upper canines projected far beneath its lower jaw. The premolars and molars of carnivores are generally adapted to shearing or cutting instead of grinding.

In illustration of the way tooth differences reflect food habits, there is the bear. The omnivorous black bear has premolars and molars well-adapted for grinding. But his seal-eating cousin, the polar bear, has premolars sharp for cutting and the molars are all but absent.

Science News Letter, May 2, 1959

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